AF/2143

| TRANSMITTAL OF APPEAL BRIEF (Large Entity) | Docket No. YOR919990214US1 |
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OIPE JAN 13 2004 PATENT & TRADEMARK OFFICE

In Re Application Of:
**Edwin Peter Dawson Pednault**

| Serial No. | Filing Date | Examiner | Group Art Unit |
|---|---|---|---|
| 09/302,154 | April 29, 1999 | M. Kapadia | 2143 |

Invention:

**A METHOD FOR CONSTRUCTING SEGMENTATION-BASED PREDICTIVE MODELS FROM DATA THAT IS PARTICULARLY WELL-SUITED FOR INSURANCE RISK OR PROFITABILITY MODELING PURPOSES**

TO THE COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on

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Frederick Cooperrider

*Signature*

Dated: **January 13, 2004**

**Frederick E. Cooperrider**
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**
**BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of

Pednault, E.

Serial No.: 09/302,154 Group Art Unit: 2143

Filed: April 29, 1999 Examiner: Kapadia, M.

For: A METHOD FOR CONSTRUCTING SEGMENTATION-BASED PREDICTIVE MODELS FROM DATA THAT IS PARTICULARLY WELL-SUITED FOR INSURANCE RISK OR PROFITABILITY MODELING PURPOSES

**APPELLANTS' BRIEF ON APPEAL**



Commissioner for Patents
Alexandria, VA 22313-1450

Sir:

Appellant respectfully appeals the final rejection of claims 1-20 in the Office Action dated August 13, 2003. A Notice of Appeal was timely filed on November 13, 2003.

## I. REAL PARTY IN INTEREST

The real party in interest is IBM Corporation, assignee of 100% interest of the above-referenced patent application.

## II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellant, Appellant's legal representative or Assignee which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

## III. STATUS OF CLAIMS

Claims 1-20, all the claims pending in the application, are set forth fully in the attached Appendix.

Claims 19 and 20 stand rejected under 35 U.S.C. § 102(e) as anticipated by US Patent 5,970,464 to Apte et al. Claims 1-18 stand rejected under 35 U.S.C. § 103(a) as unpatentable over 5,970,464 to Apte et al., further in view of US Patent 5,692,107 to Simoudis et al.

## IV. STATEMENT OF AFTER-FINAL AMENDMENTS

A Request for Reconsideration under 37 CFR §1.116 and Declaration under 37 CFR §1.132 were filed on October 14, 2003. In Advisory Action dated November 13, 2003, the Examiner stated that this Request for Reconsideration and Declaration will be entered for purpose of this appeal. The Examiner also alleged that the Request for Reconsideration and Declaration do not place the Application in condition for allowance.

## V. SUMMARY OF THE INVENTION

The claimed invention, as disclosed and claimed, for example, by independent claim 1, is directed to a program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method for constructing segmentation-based models that satisfy constraints on the statistical properties of the segments.

A collection of training data records is presented. The training data records comprise examples of input values that are available to the model together with the corresponding desired output value(s) that the model is intended to predict.

On the basis of the training data, a plurality of segment models are generated, that together comprise an overall model. Each segment model is associated with a specific segment of the training data.

This process of generating the segment models includes: a) generating alternate training data segments and associated segment models, b) evaluating at least one generated segment to determine whether it satisfies at least one statistical constraint, and c) selecting a final plurality of segment models and associated segments from among the alternates evaluated that satisfy at least one of said statistical constraints.

Because the computer software includes program instructions to check whether a proposed segment satisfies at least one statistical constraint, the software thereby guides the segment construction process. This segmentation-checking procedure is analogous to the difference between an open-loop system and a closed-loop system.

## VI. ISSUES PRESENTED FOR REVIEW

The Appellant presents the following issues for review by the Board of Patent Appeals and Interferences:

1. Whether the rejection under 35 U.S.C. § 102(e) for claims 19 and 20 and the rejection under 35 U.S.C. § 103(a) for claims 1-18 meet an Examiner's initial burden for a *prima facie* rejection, when the rejections of record clearly ignore the plain meaning of the claim language and fail to interpret the terms of art as would be interpreted by one of ordinary skill in the art; and

2. Whether a rejection is properly maintained by an Examiner, when the Examiner relies upon the terminology "actual pure premium" as meaning "a statistical constraint", when this terminology is not reasonably interpreted by one of ordinary skill in the art as being a statistical constraint and when the Appellant, himself a published and recognized expert in the field, makes a declaration on the record that this terminology "actual pure premium" is not a statistical constraint and that one of ordinary skill in the art would not interpret this terminology "actual pure premium" as being a statistical constraint.

## VII. GROUPING OF THE CLAIMS

As supported by the following arguments, independent claim 1 and dependent claims 5-8 and 11 stand or fall together, independent claim 2 and dependent claims 9 and 12 stand or fall together, independent claim 3 and dependent claims 10 and 13 stand or fall together, independent claim 4 stands or falls by itself, independent claims 14 and 16 and dependent claims 15, 17, and 18 stand or fall together, and independent claim 19 and dependent claim 20 stand or fall together.

## VIII. ARGUMENTS

### A. THE EXAMINER'S POSITION ON INITIAL BURDEN

The Examiner rejects claims 19 and 20 as anticipated by Apte and rejects claims 1-18 as unpatenable over Apte, further in view of Simoudis. As best understood from the Examiner's discussion in the above-referenced Advisory Action, the Examiner also considers that Apte would inherently teach a medium containing computer instructions, thereby seemingly alleging that Apte actually anticipates all claims 1-20 and that Simoudis is actually not even necessary for a proper rejection.

Taking claim 1 as an example for purpose of discussion in this section, the Examiner alleges that:

- lines 33-40 of column 4 of Apte teaches "... generating alternate training data segments and associated segment models";

- lines 28-33 of column 4 teaches "... evaluating at least one generated segment to determine whether it satisfies at least one statistical constraint", when "actual pure premium" is interpreted as being a "statistical constraint"; and

- lines 33-36 of column 4 teaches "... selecting a final plurality of segment models and associated segments from among the alternatives evaluated that satisfy at least one of said statistical constraints".

Thus, it appears that the Examiner considers that the discussion at lines 33-40 of column 4, in which lines the user is described as "... *interactively experimenting with fine tuning the eligibility criteria for the product, until the segments that are dragging the overall loss down are satisfactorily removed*", satisfies the intent of the preamble in combination with the subsequent limitations, which together requires "a program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method ... generating alternate training data segments and associated segment models...."

Second, it appears that the Examiner considers as being relevant the description at lines 28-30 of column 4, which description again relies upon the user to perform an evaluation: "*The end user can now examine each of these segments and their estimated pure premiums.*" The Examiner is understood as considering that this description satisfies the intent of the preamble in combination with the subsequent limitations, which together requires "a program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method that further includes: "... evaluating at least one generated segment to determine whether it satisfies at least one statistical constraint...."

Third, the Examiner states that he considers that "actual pure premium" is a "statistical constraint".

Finally, it appears that the Examiner considers that the description at lines 33-36 of column 4 is relevant. These lines recite: "*The user of the solution can now begin interactively experimenting with fine tuning the eligibility criteria for the product, until the segments that are dragging the overall loss down are satisfactorily removed.*" Accordingly, it is understood that the Examiner consider that this sentence demonstrates that Apte satisfies the intent of the preamble in combination with the subsequent limitations, which together requires "a program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method that further includes: "...selecting a final plurality of segment models..." of the final limitation of claim 1.

## B. APPELLANTS' POSITION ON THE INITIAL BURDEN ISSUE

**The Examiner's position is flawed as a matter of law.**

The rejection of record cannot reasonably be considered as meeting the Examiner's initial burden required for a *prima facie* rejection under 35 USC §103(a) when it clearly fails to accord the plain meaning of the claim language. The Examiner seems to view the "broadest reasonable interpretation" instruction in the MPEP as a license to ignore the plain meaning of the claim language.

However, as clearly described in MPEP §2111, the correct legal standard includes a constraint: "The broadest reasonable interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach." [emphasis by Appellant]

Along these lines, it is noted that the plain meaning of the limitations of the independent claims do not recite something along the following: "... receiving inputs from a user and recalculating a new model, as based on new segments selected by said user; providing a display of one of said new segments to said user to allow said user to evaluate whether said new segment satisfies at least one statistical constraint; and receiving inputs from said user as being a selection of a final plurality of segment model."

It is important to note that, if the Appellant had intended to rely upon user inputs for any of the claimed limitation, the claim limitations would have been drafted to reflect this intent. That is, the Appellant would have used wording having the intended plain meaning that "the user generates ...; the user evaluates ... ; and the user selects ..."

Indeed, it is noted that not one claim makes even a hint of a suggestion for a user's input or contribution to the claimed process. Moreover, the description in the specification indisputably supports the Appellant's assertions repeatedly made on the record that it is the software that is automatically performing these recited steps, not a user.

The Appellant's choice of claim wording reflects exactly the intended plain meaning that it is the computer software that executes the "... generating ...; evaluating ...; and selecting ...." This intended meaning is even more clearly specified in independent claims 14, 16, and 19. Thus, there is no ambiguity in any of the claims that it is the user's contribution that is being described and claimed.

It is the Examiner that has improperly imported into the plain meaning of the claims that the language recites a user's inputs or contribution. No such interpretation is possible in the plain meaning of the claim language and no such interpretation is possible from the description in the specification.

The purpose of the "broadest reasonable interpretation" mandate is clearly described in MPEP §2111: "Applicant always has the opportunity and to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than justified." [emphasis by Appellant]

Along this line, it is noted that nowhere in the specification of the present Application is there a suggestion or description of a user's contribution that would permit an interpretation described in the lines of Apte upon which the Examiner relies. Therefore, Appellant submits that the Examiner cannot reasonably reject the claims based on an interpretation that is not even supported in the specification.

The present invention does not at all address a computerized tool that relies upon the user's inputs for the "... generating ...; evaluating ...; and selecting ..." described in the claim language. The Appellant has stated this repeatedly on the record: it is the software that is executing the defined claim language, not the user. No court will allow the Appellent to later assert that the claim language includes user actions, when the specification clearly describes these steps as being automatically done by the computer itself. Nor is there any need for such assertion, since the present invention clearly provides a technique that is objectively obtained by software instructions, without experimentation by the user.

The Examiner has no basis to reject claims on a ground that has been clearly repudiated on the record. That is, a Federal District judge is perfectly capable of reading and understanding the prosecution history.

**The Examiner's position is flawed as a matter of fact.**

Along this same line that plain meaning, as interpreted by one of ordinary skill in the art, must be the objective standard in claim construction, Appellant submits that the interpretation of the prior art is also constrained by this plain language interpretation. That is,

an Examiner cannot contort the meaning of a prior art reference so that the claim would thereby read upon the prior art reference.

In the present evaluation, Appellant submits that Apte does not at all teach the Examiner's strained interpretation. As one significant example, at lines 5-6 on page 2 of the Advisory Action, the Examiner states:

*Apte at col. 4, lines 28-33, clearly indicates that the "actual pure premium" has a value of "$350." This value of "$350" is not predicted but entered by the user as the desired quarterly pure premium, col. 4, lines 9-16.*

However, a closer examination of lines 28-33 of column 4 clearly uses the terminology "actual premium" not "actual pure premium", as asserted by the Examiner. As clearly demonstrated at lines 33-34 of column 1, the "actual premium" is the amount actually paid by the client for the insurance product. In accordance with lines 30-32 of column 1, the "actual pure premium" describes the premium at which the expected claims payout actually does equal the premium charged.

These terms cannot be used interchangeably and an evaluation based on mixing concepts and terminology would be inherently improper.

As a second example of a strained interpretation, the Examiner considers that lines 28-33 of column 4 teaches "... evaluating at least one generated segment to determine whether it satisfies at least one statistical constraint".

However, a fair reading of these lines provide the following:

- In lines 28-29, it is stated that "the end user can now examine each of these segments and their estimated pure premiums". This sentence would not reasonably be interpreted as suggesting that the end user is instructed to evaluate a segment to determine whether it satisfies at least one statistical constraint. That is, there is no mention of a statistical constraint in this sentence. Indeed, it would seem that this sentence is directing the user to examine the estimated pure premium associated with that segment, rather than the segment itself, as clearly required by the plain meaning of the claim language.

- In lines 29-33, it is stated that "... if the product's actual premium is $350, and segments that fall within the eligibility list and and whose estimated pure premiums are

significantly higher than this figure are candidates for exclusion from the product." Again, this sentence would seem to clearly state that the evaluation criterion is the "estimated premium" of a segment, rather than the segment itself.

Thus, neither of these two sentences can reasonably be described as teaching an evaluation of the segment itself. Rather, these two sentences clearly instruct the user to evaluate the estimated pure premium of that segment, not the segment itself.

Moreover, in considering these two sentences as providing the support for the Examiner's burden of demonstrating a "statistical constraint", it would seem that the Examiner is actually relying upon "estimated pure premium" as being the "statistical constraint", rather than "actual pure premium". Again, the Examiner seems to be confusing the terminology in Apte.

The probabilistic nature of the "prediction of a pure premium" is clearly described by line 65 of column 3 through line 5 of column 4. More specific, in lines 4 and 5 of column 4, there will be a number that is the "estimated quarterly pure premium" (e.g., $700), along with an error estimate (e.g., 0.2) and a confidence interval (e.g., 0.008).

Appellant submits that, to one of ordinary skill in the art, this description clearly indicates that "estimated quarterly pure premium" is merely a number of dollars for the estimated quarterly pure premium for that segment; it is not a "statistical constraint" (as this term would be understood by one of skill in the art), let alone a statistical constraint of a segment.

That is, although the entity "estimated quarterly pure premium" has an associated statistical description, the entity itself is not a statistical constraint.

The Examiner cannot simply ignore this plain meaning of the description in Apte and summarily declare that, because "estimated quarterly pure premium" has an associated statistical description, then "estimated quarterly pure premium" is itself a statistical constraint. It is not. "Estimated quarterly pure premium" is simply a number representing a dollar amount (e.g., $700).

Moreover, the statistical description in these lines concern a statistical description of the entity "estimated quarterly pure premium". It does not describe a statistical constraint of

the segment. Again, the Examiner cannot simply ignore the plain meaning of this description in Apte.

## C. THE EXAMINER'S POSITION ON THE ISSUE OF "ACTUAL PURE PREMIUM" AS MEANING "A STATISTICAL CONSTRAINT"

The Examiner states in the penultimate limitation for the rejection for the independent claims (e.g., for claim 1): "... the examiner interprets "actual pure premium" as a "statistical constraint."

Thus, it appears that the Examiner concludes that an "actual pure premium" would be reasonably described by one of ordinary skill in the art as being a "statistical constraint".

Second, at lines 13-33 of page 2 of the Advisory Action, the Examiner states that he finds the Appellants Declaration Under 37 C.F.R.§1.132 as being non-persuasive.

## D. APPELLANTS' POSITION ON THE ISSUE OF "ACTUAL PURE PREMIUM" AS MEANING "A STATISTICAL CONSTRAINT"

**The Examiner's position is flawed as a matter of law.**

As clearly stated in MPEP §2111.01: "*Plain meaning" refers to the meaning given the term by those of ordinary skill in the art.*" [emphasis by Appellant]

Thus, the burden does not shift from the Examiner by merely making a conclusory statement. Should the Examiner wish to maintain that one of ordinary skill in the art would interpret "actual pure premium" as a "statistical constraint", the Examiner would have to provide a reasonable reference supporting that allegation.

No such reference has been brought forward in the rejection currently of record, and Appellant submits that the rejection is improper without such reference as support.

Relative to the Examiner's finding that the Appellant's Declaration Under 37 C.F.R. §1.132, Appellant submits that the Examiner seems to misunderstand the legal significance of this affidavit, when the Examiner has not yet met the initial burden or the Examiner's conclusory statement has reasonably been disputed by the Appellant.

Until the Examiner provides a reasonable reference to support his conclusory statement that one of ordinary skill in the art would understand "actual pure premium" as a "statistical constraint", the Appellant's affidavit cannot simply be summarily dismissed as "non-persuasive". The initial burden is on the Examiner, not on the Appellant.

By this Declaration, Appellant states on the record that he is a recognized expert in this art and a co-inventor of Apte. Appellant further states in this Declaration that, from his perspective as an expert and a co-inventor of Apte, the Examiner's conclusory statement is incorrect that "actual pure premium" can be reasonably considered a "statistical constraint".

Appellant submits that, as a matter of law, this Declaration, particularly when viewed together with the Appellant's more detailed explanation below and in the remainder of the record, forces the Examiner to demonstrate that he has indeed met his initial burden by producing a reference that supports his conclusory statement.

**The Examiner's position is flawed as a matter of fact.**

As Appellant has explained in the Request for Reconsideration filed on October 14, 2003, the term "pure premium" has a clear and unambiguous specific meaning in this art. The use of the adjective "actual" in Apte has to do with the choice of sentence construction in Apte, rather than being an additional term of art.

The issue with the Examiner's interpretation of "actual pure premium" is that he completely misinterprets the meaning of the only sentence in Apte et al. that contains this term (Apte, col. 3, line 65 to col. 4, line 1), as follows. Unfortunately, the sentence contains ellipses, which may be part of the Examiner's confusion. Below is a rewrite of the sentences without ellipses (e.g., with implied words appearing in square brackets). For clarity, also presented below is the immediately preceding and following sentences in Apte that establish the context for the ellipses.

*".... The consequence <sic> of such rules will typically be a prediction of a pure premium for the data points that satisfy the antecedent. The prediction will be probabilistic, i.e., associated with the prediction, in addition to the actual [predicted value of the] pure premium, will be estimates of the accuracy [of the said predicted value] and [of the statistical] confidence in the [said] accuracy. An example of a rule extracted by the data*

*mining process might be "If `male driver` and `age less than 25` and `car type is 2-door sports sedan`, Then `estimated quarterly pure premium=$700` with `error estimate=0.2` and `confidence interval=0.008`."*

Thus, in the above quote, the first sentence establishes that the consequents of the rules that are produced by data mining comprise predictions of pure premium. The sentence in question then establishes that each such prediction of pure premium has three parts: (1) a predicted pure premium value, (2) an estimated accuracy of said predicted pure premium value, and (3) a statistical confidence in the said estimated accuracy. The third sentence then presents an example of a rule in which all three said parts of a prediction of pure premium appear in the consequent of the example rule.

The Examiner has flatly rejected the interpretation of "the actual pure premium" to mean "the actual predicted value of the pure premium". Instead, the Examiner has ignored the definite article "the" that precedes "actual pure premium" in the sentence in question, and has apparently adopted the position that the definite article "the" can be replaced with the indefinite article "an." The Examiner has then taken the liberty to interpret an "actual pure premium" to mean a desired quarterly premium to be changed for a proposed insurance product (see Section 7A of the latest Office Action, dated August 13, 2003).

Replacing "the" with "an" is invalid because it changes the logical meaning of the sentence in question. Interpreting "pure premium" to mean the premium charged for an insurance product is also invalid because the two terms have distinct specific meanings in the insurance field.

Moreover, these specific meanings are described in Apte, col. 1, lines 29 to 35. It is noted that Applicant does not need to make the assertion that the terms differ, it is already done in Apte. Thus, the Examiner's argument is illogical because it clearly ignores Apte, col. 1, lines 29 to 35 in the most recent Office Action.

Finally, as noted above, the Examiner consistently confuses terminology in a basic manner. As pointed out above, at lines 5-6 on page 2 of the Advisory Action, the Examiner states:

*Apte at col. 4, lines 28-33, clearly indicates that the "actual pure premium" has a value of "$350." This value of "$350" is not predicted but entered by the user as the desired quarterly pure premium, col. 4, lines 9-16.*

However, lines 28-33 of column 4 clearly uses the terminology "actual premium" not "actual pure premium" as asserted by the Examiner.

It goes without saying that a rejection cannot be proper if the Examiner keeps mixing up the terminology as part of the evaluation.

## IX. CONCLUSION

In view of the foregoing, Appellants submit that claims 1-20, all the claims presently pending in the application, are sufficiently enabled and are clearly and patentably distinct from the prior art of record and in condition for allowance. Thus, the Board is respectfully requested to remove all rejections of claims 1-20.

Please charge any deficiencies and/or credit any overpayments necessary to enter this paper to Assignee's Deposit Account number 50-0510.

Respectfully submitted,

Dated: 1/13/04

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## APPENDIX

1. (Previously presented) A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method for constructing segmentation-based models that satisfy constraints on the statistical properties of the segments, the method comprising:

(1) presenting a collection of training data records comprising examples of input values that are available to the model together with the corresponding desired output value(s) that the model is intended to predict; and

(2) generating on the basis of the training data a plurality of segment models, that together comprise an overall model, wherein each segment model is associated with a specific segment of the training data, said generating comprising performing optimization comprising:

a) generating alternate training data segments and associated segment models;

b) evaluating at least one generated segment to determine whether it satisfies at least one statistical constraint; and

c) selecting a final plurality of segment models and associated segments from among the alternates evaluated that satisfy at least one of said statistical constraints.

2. (Previously presented) A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method for

constructing segmentation-based models that satisfy constraints on the statistical properties of the segments, the method comprising:

(1) presenting a collection of training data records comprising examples of input values that are available to the model together with the corresponding output value(s) that the model is intended to predict; and

(2) generating, on the basis of the training data, a plurality of segment models, that together comprise an overall model, wherein each segment model is associated with a specific segment of the training data, said generating comprising performing optimization comprising:

a) generating alternate training data segments and associated segment models using statistical constraints to guide the construction of the data segments in a closed-loop fashion so as to ensure that the resulting data segments satisfy the statistical constraints; and

b) selecting a final plurality of segment models and associated segments from among the alternates generated.

3. (Previously presented) A program storage device readable by a machine, tangibly embodying program instructions executable by the machine to perform a method for constructing segmentation-based models that satisfy constraints on the statistical properties of the segments, the method comprising:

(1) presenting a collection of training data records comprising examples of input values that are available to the model together with the corresponding desired output value(s) that the model is intended to predict; and

(2) generating, on the basis of the training data, a plurality of segment models, that together comprise an overall model, wherein each segment model is associated with a specific segment of the training data, said generating comprising:

a) generating alternate pluralities of data segments and associated segment models; and

b) adjusting the alternate pluralities so that the resulting data segments satisfy the statistical constraints.

4. (Previously presented) A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method for constructing segmentation-based models of insurance risks, the method comprising:

(1) presenting a collection of training data comprising examples of historical policy and claims data; and

(2) generating on the basis of the training data a plurality of segment models, that together comprise an overall model, wherein each segment model comprises a statistical model of insurance risk that is associated with a specific segment of the training data, said generating comprising:

a) generating alternative pluralities of segment models in one of a top-down fashion and a bottom-up fashion;

b) comparing said alternative pluralities of segment models using statistical likelihood scores based on statistical models of insurance risk; and

c) selecting a final plurality of segment models and associated segments from among the alternates generated so as to optimize aggregate statistical likelihood scores for the plurality.

5. (Previously presented) The program storage device of claim 1, wherein said evaluating at least one generated segment to determine whether it satisfies at least one statistical constraint comprises:

performing a test whose outcome is not equivalent to a comparison between the number of training records of at least one species of training records belonging to the segment and a numerical quantity that is selectively dependent on the combination of species of training records being considered but otherwise constant for all generated segments that are evaluated.

6. (Previously presented) The program storage device of claim 1, wherein said statistical constraint comprises at least one constraint on a statistical estimation error of the corresponding segment model.

7. (Previously presented) The program storage device of claim 1, wherein said model relates to an insurance risk model and said at least one statistical constraint comprises an actuarial credibility constraint.

8. (Previously presented) The program storage device of claim 7, wherein each said generated segment is evaluated using a statistical constraint based on a threshold calculated for that generated segment, said threshold based on statistical properties of claim amounts in said generated segment.

9. (Previously presented) The program storage device of claim 2, wherein said statistical constraint comprises at least one constraint on a statistical estimation error of the corresponding segment model.

10. (Previously presented) The program storage device of claim 3, wherein said statistical constraint comprises at least one constraint on a statistical estimation error of the corresponding segment model.

11. (Previously presented) The program storage device of claim 1, wherein said generating alternate training data segments and associated segment models comprises splitting larger data segments into smaller data segments.

12. (Previously presented) The program storage device of claim 2, wherein said generating a plurality of segment models comprises splitting larger data segments into smaller data segments.

13. (Previously presented) The program storage device of claim 3, wherein said generating alternate training data segments and associated segment models comprises splitting larger data segments into smaller data segments.

14. (Previously presented) An apparatus comprising:

(1) a receiver to receive a collection of training data records comprising examples of input values that are available to a model together with the corresponding desired output value(s) that the model is intended to predict; and

(2) a calculator to generate, on the basis of the training data, a plurality of segment models, that together comprise an overall model, wherein each segment model is associated with a specific segment of the training data, wherein the generation of said plurality of segment models comprises an optimization process comprising:

a) generating alternate training data segments and associated segment models, each said generated segment having been evaluated to determine whether it satisfies at least one statistical constraint; and

b) selecting a final plurality of segment models and associated segments from among the alternates evaluated that satisfy said statistical constraints.

15. (Previously presented) The apparatus of claim 14, wherein said model relates to an insurance risk model and said at least one statistical constraint comprises an actuarial credibility constraint.

16. (Previously presented) A computerized method for constructing segmentation-based models that satisfy constraints on the statistical properties of the segments, the method comprising:

presenting, to a computer, a collection of training data records comprising examples of input values that are available to a model, together with the corresponding desired output value(s) that the model is intended to predict; and

based on said training data, automatically generating on said computer, a plurality of segment models, that together comprise an overall model, wherein each segment model is associated with a specific segment of the training data, said generating comprising performing optimization comprising:

generating alternate training data segments and associated segment models, each said generated alternate training data segment having been determined to satisfy at least one statistical constraint; and

selecting a final plurality of segment models and associated segments from among the alternates evaluated that satisfy said statistical constraints.

17. (Previously presented) The computerized method of claim 16, wherein said statistical constraint comprises at least one constraint on a statistical estimation error of the corresponding segment model.

18. (Previously presented) The computerized method of claim 16, wherein said model relates to an insurance risk model and said at least one statistical constraint comprises an actuarial credibility constraint.

19. (Previously presented) A method of at least one of managing and providing consultation for financial decisions, said method comprising at least one of generating, transmitting, receiving, and forwarding a report executed by a computer, said computer having executed a program of instructions to perform a method for constructing segmentation-based models that satisfy constraints on the statistical properties of the segments, the method executed by said machine comprising:

(1) presenting, to a computer, a collection of training data records comprising examples of input values that are available to a model, together with the corresponding desired output value(s) that the model is intended to predict; and

(2) based on said training data, automatically generating, on said computer, a plurality of segment models, that together comprise an overall model, wherein each segment model is associated with a specific segment of the training data, said generating comprising performing optimization comprising:

a) generating alternate training data segments and associated segment models;

b) evaluating at least one generated segment to determine whether it satisfies at least one statistical constraint; and

c) selecting a final plurality of segment models and associated segments from among the alternates evaluated that satisfy said statistical constraints.

20. (Previously presented) The method of claim 19, wherein said model relates to an insurance risk model, said at least one statistical constraint comprises an actuarial credibility constraint, and said financial decision relates to at least one of:

a price structure for insurance policies; and

a policyholder profitability.